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Thesis

A CLASSIFICATION OF NON-LETTER TYPEWRITING ERRORS

Submitted by

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CHAPTER I

STATEMENT OF THE PROBLEM AND DEFINITION OF TERMS

The purpose of this thesis is to classify non-letter typewriting errors according to their order of frequency. A non-letter error includes such errors as uneven left margin, paper not straight in the machine, backspace key incorrectly used, strikeovers, space bar incorrectly struck, and improper division of words, to name a few. It does not concern itself with such errors as incorrectly typed alphabetical letters, numbers, or symbols as found on the upper case of the number keys.

The objectives of this thesis will be as follows:

1. To make known the multiplicity of non-letter errors so that proper remedial and corrective work can be given.

2. To determine the frequency of non-letter typewriting errors.

3. Suggested remedial practices for non-letter typewriting errors.

For the purposes of clarification, it will be necessary to define terms used in this study.

Classification: This is the compiling of restricted data into specific categories or classes on the basis of the nature of the data.

Classification chart: A chart or graph containing previously gathered information having to do with pupil measurements and records for the purpose of classification.

Tally sheet: A sheet upon which is kept any account or score by tally: A mark connecting a group in counting, as a diagonal line through four vertical lines, made for a fifth count. Hence, a number used as a measure of computation.

Non-letter error: An incorrect movement, manipulation, or calculations by the typist including every type of error except incorrectly struck letters, numbers, and symbols.

Cumulative chart: A paper showing graphically, the total up to the present time, or the frequency up to a definite point.

Diagnosis: To diagnose is to carefully examine a definite thing looking for items that will lead to a judgment.

Frequency list: Words or expressions arranged in such a manner as to show the number of times they occur in a given number of running words. This arrangement can be alphabetically or in ascending or descending order of occurrence.

Kimball Contest Copy: Continuity straight copy material used in international typewriting contests. This type of material has long been used as practice material in typewriting classes. It is not difficult. The syllabic intensity is approximately 1.4.

Manipulation error: An incorrect movement of the typist or typewriter causing a non-letter error to occur on the paper or an error in the operation of the typewriter.

Letter error: An incorrectly struck letter, number, or symbol.

Mental error: A non-letter error caused by the mind rather than by an incorrect operation of the typewriter.

Lack of Knowledge error: A non-letter error caused by ignorance of the typist in respect to not understanding the rules or directions involved, or not having an appreciation of the fundamental requirements to good typewriting.

The above definitions are supported by the Dictionary of Education and Webster's Collegiate Dictionary, 5th Edition.

DELIMITATION OF THE PROBLEM

The study of typewriting errors, their causes and remedies is so large in scope that it will be necessary to take only one aspect of typewriting difficulties, non-letter errors. This type of error should be of great interest to the typewriting teacher. There have been no previous studies dealing wholly with this subject. Previous studies have delved on letter errors, their causes and the proper corrective drills to be applied but in this report, a thorough investigation will be made on non-letter errors. Causes of these errors will be given and also suggested remedial work which would be helpful in correcting these errors.

PURPOSE OF THE PROBLEM

Many authorities in typewriting have felt the need for diagnostic charts time and time again. William F. Book says:

> By recording the number and kinds of errors made by his students, a teacher may ascertain the exact kind of difficulties which cause them the most trouble and apply a remedy that will prevent or correct them at once, because he can then determine what must be done to avoid or meet successfully the particular difficulties which are producing the errors.

Most of the studies in the past having to do with typewriting errors have laid emphasis on the striking of incorrect letter keys, and the frequency of such incorrect reaches. These studies have brought forth statistical data which have been very helpful to teachers in recognizing which letters, due to various reasons, offer the greatest typing difficulties. It is felt that not enough research has been completed having to do with the non-letter typing difficulties encountered.

It is known that non-letter errors are less common than letter errors but nevertheless, typing difficulties will remain until the non-letter errors are studied, the causes uncovered, and the proper remedial work applied. This statement is substantiated by the following excerpt:

> ...it should be emphasized that an adequate error analysis must include much more than merely a record stroking errors, as there are many technique errors to be considered in an analysis; and particularly during early training, unless the teacher is able to determine, by observation and charting, those technique errors

[1] William F. Book, Learning to Typewrite, Gregg Publishing Company, New York, 1925, p. 238.

> repeated time and time again, and thus attempts to correct such errors, the student will continue to use the wrong technique.[1]

Diagnosis is a means to an end and not an end in itself. If the results or findings are not acted upon, then the diagnosis is of no value. Each non-letter error must be clearly identified. According to Harold H. Smith,[2]

> The purpose of diagnosis in typing, as in medicine, is to discover the actual state of affairs. Diagnosis must be specific, not general. The doctor does not merely say, "This man is sick." He determines that a specific thing or process is at fault and then applies a specific remedy.

Esby C. McGill[3] has this to say:

"Much can be done toward correcting typewriting difficulties through error analysis."

The importance of an error analysis chart was recognized by Book[4] when he stated that,

> Many common and persistant errors in typing are made which naturally impede a writer's progress. These should, as far as possible, be prevented by removing the conditions which produce them. By recording the number and kinds of errors made by his students, a teacher may ascertain the exact kind of difficulties which cause them the most trouble and apply a remedy that will prevent or correct them at once, because he can then determine what must be done to avoid or meet successfully the particular difficulties which are producing the errors.

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[1] E. G. Blackstone, Improvement of Instruction in Typewriting, Prentice-Hall, Inc., New York, 1945, p. 363.

[2] Harold H. Smith, Diagnostic Testing and Remedial Teaching, Part I, Journal of Business Education, September 1932, p. 11.

[3] Esby C. McGill, Typewriting Error Analysis, Balance Sheet, October 1943, p. 62.

[4] William F. Book, Learning to Typewrite, Gregg Publishing Co., New York, 1925, p. 238.

According to one of the major laws of learning, the Law of Effect, bad habits form just as easily as good habits. The strength of a good habit decreases in direct proportion to the recurrence of a bad habit. Blackstone[1] carries this thought further in his book when he says:

> It is natural that students make mistakes. It is also natural that each error tends to break down his ability to make a particular movement correctly, for each incorrect act tends to make the correct movement in succeeding attempts less likely to occur. Therefore, it is essential to satisfactory learning progress that the errors be discovered and checked before they become habitual.

Errors will not disappear on their own accord. There must be a definite procedure for eliminating them. Blackstone[2] further states that,

> The modern teacher, instead of merely urging the student to be more accurate begins to analyze the mistakes the student has made. Until the teacher does discover the pupil's habitual fault and does make adequate provisions for overcoming the difficulty, however, little improvement or progress may be expected.
>
> Modern physicians do not give general tonics regardless of the ills of their patients. They find it necessary to determine very accurately the nature of the physical ills before they can prescribe the correct treatment. Similarly, the typing teacher must diagnose the nature and causes of errors before he can cure his patients.

It is with the aid of error analysis charts that the teacher can diagnose the difficulties of his students. In

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[1] E. G. Blackstone and S. L. Smith, Improvement of Instruction in Typewriting, Prentice-Hall, New York, 1945, p. 364.

[2] Loc. cit.

this report, an analysis chart of the non-letter typewriting difficulties of the students in the survey will be listed and the findings given in Chapter 3.

Lomax's interpretation of an error analysis chart very clearly brings out its value:[1]

> ...to know the particular learning difficulties which characterize the progress of each member of the class, as well as the class as a whole, and to provide corrective measures which can be used in remedial instructions.

All educators do not believe in the value of error charts. Mr. Harold H. Smith,[2] of the Gregg Publishing Company, is one of those opposed to their use. As a substitute, he offers a chart which lists various types of errors, the cause of these errors and how they can be improved. This chart lists errors that have not been considered in the past and that enhances its value over other error charts. Mr. Smith is of the opinion that the major purpose of error charts lies in acquainting the teacher with possible causes and treatments. He further states that many error charts give information on how many mistakes were made on certain keys, but the chart does not tell how many times the letter was attempted and how many times it was misstruck. It might have been that the fault was that the typing was on a higher

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[1] Paul S. Lomax, Problems of Teaching Typewriting, Prentice-Hall, New York, 1935, p. 198.

[2] Harold H. Smith, American Shorthand Teacher, Vol. 10, No. 6, Gregg Publishing Company, New York, February 1931, pp. 210-211.

level than that of individual stroking, and the sequence of the strokes or some element of mental or nervous skill is really at fault rather than the strokes themselves. An error chart would not disclose these facts.

Another fault found by Mr. Smith in regard to error charts is that the tabulated results become "cold" due to the fact that time passes between the time the errors are made and the results are drawn. This is in direct contrast to one of the principles of learning which is that effort for improvement should follow immediately upon the recognition of the need for improvement. Mr. Smith suggests a plan whereby not only errors in typing are considered but also errors in technique. This plan would attack errors as they occur.

The need for an error analysis was recognized many years ago by Dr. D. D. Lessenberry when he stated that:[1]

> Preventing errors is better than correcting them, but when errors are made by the pupils, the errors must be analyzed and corrective drills formulated in order that the faulty technique causing the errors may be eliminated.

He continues by saying:

> In the typing classroom, we must critically study every detail of our work and try and perfect each phase of our teaching technique; we must give our students work habits which will definitely insure the development of typing power.

It is with this thought in mind that this thesis is written.

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[1] D. D. Lessenberry, Eastern Commercial Teachers Association Yearbook, 1931, p. 138.

WHAT CAN BE DONE WITH THE RESULTS OF THIS STUDY

Unless the timed writings of students are closely scrutinized, there are some errors of the non-letter type that can very easily go undetected. It is hoped that those reading this report will gain an insight as to types of non-stroking errors that are possible. These could be classified into the following groups:

Technique errors

Manipulation errors

Lack of knowledge errors

Inattentiveness errors

Machine errors

Letter errors in typewriting are important. Non-letter errors are just as important because they lower the efficiency of the typist and unknowingly cause him to make more errors than is necessary. It is further hoped that this study will bring those "hidden" errors to light so that the proper remedial work can be given.

CHAPTER II

A DIGEST OF SOME RECENT TYPEWRITING ERROR ANALYSIS STUDIES

Recognizing the importance of studies pertaining to typewriting errors of the non-letter type, it has been decided to digest the outstanding studies on this subject that have been made to date. Each of these has proved of real and constructive value in the improvement of construction in typewriting.

Pille reports that in 1931 in California there were 11,915 pupils enrolled in first semester typewriting who were included in a state test.[1] These students were in grades eight to twelve and in some cases grade seven.

It was impossible to check all errors; therefore, it was confined to:

1. Eight and ninth grade pupils
2. Pupils who were receiving instruction from 30 - 47 minutes daily
3. Pupils who, due to penalties attached to errors, were not averaging 10 net words per minute

Out of 11,915 papers, 956 were selected. Of these:

296 scored less than 1-0 net words per minute

[1] Elsa Marie Pille, "First Semester Typewriting Errors," Journal of Business Education, December 1933, Vol. 9, p. 8, 10.

212 scored less than 0-4 net words per minute

448 scored less than 5-9 net words per minute

It was discovered in this state wide investigation in 1931 by Dr. Ira W. Kibby, Chief of the Bureau of Business Education for the state of California that no less than thirty per cent of the senior and four year high schools and forty-nine per cent of the junior high school students in first semester typewriting classes failed to average 10 net words per minute. This was due to an excessive number of errors. A total of 6,847 errors were analyzed.

The distribution of these errors was as follows:

1. Letter errors - total 4609
   a. Substitution - 3507 Right hand mainly responsible
   b. Strike-overs - 505
   c. Transposition - 245
   d. Omission - 224
   e. Insertion - 126
2. Word errors - total 539 errors
   a. Omission - 263
   b. Syllibication - 187
   c. Insertion - 51
   d. Substitution - 38
3. Punctuation errors - total 312 errors
   a. Hyphen - 130
   b. Comma - 74
   c. Period - 72
   d. Semi-colon - 36

4. Machine manipulation errors - total 1389 (Non-letter errors)

   a. Incorrect spacing within a line - 678 (10%)

   b. Short line - 168

   c. Broken word at end of line - 139

   d. Faulty shifting - 134

   e. Jumbled type - 79

   f. Incorrect paragraphing - 62

   g. Irregular line spacing - 41

   h. Improper carriage return - 39

   i. Piling - 31

   j. Overrun line - 18

It is interesting to note that of the 6,847 typewriting errors made in this study, 1389 errors or 20 per cent of the total errors made were of the non-letter type.

Six thousand eight hundred forty-seven (6,847) errors were checked averaging 7.16 errors per paper or an average of 1.43 errors a minute for five minutes.

Pille observed as a result of her study:

> Fundamentally, all errors are due either to actual pupil difficulties in typewriting or to certain teacher weaknesses. More often, both are responsible. To eliminate errors effectively, reinforced teaching, remedial instruction, and corrective procedures become necessary. Yet before any of these methods can be adopted, a factual determination of the number and kinds of errors actually made in typewriting is essential. It was with this thought in mind that a detailed examination of the state test papers and tabulation of their typewriting errors was decided upon.

The important findings deduced from the study are given below:

"1. As the net rate of typewriting increased, the percentage of word, punctuation, and machine manipulation errors decreased. The percentage of letter errors was the only one that increased.

"2. This increased rate of speed accomplished by a decrease in the number of all types of errors - including machine manipulation.

"3. As the net rate of speed increased, word errors showed the greatest decrease in percentage; followed by machine manipulation errors; and finally by punctuation errors which showed the slightest decrease in percentage."

Rowe[1] discovered that 20 per cent of the total typewriting inaccuracies were due to errors in the use of the non-letter keys. He classified the 52 different kinds of non-letter errors into nine general classes:

a. throwing the carriage

b. adjusting the carriage

c. adjusting the paper

d. spacing on the page

e. operation of shift key and lock

f. backspace key

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[1] Clyde E. Rowe, "Correcting Non-letter Errors in Typewriting," Journal of Business Education (March 1931) Vol. 5 No. 6, p. 30-31.

g. tabular key

h. tab stops

i. space bar

It is significant to note that both Elsa Pille and Clyde Rowe arrived at 20 per cent as the percentage of non-letter errors to letter errors on the typewriter. In the case of Miss Pille who checked over 956 papers, it was found that 1,389 of the 6,847 typewriting errors were due to machine manipulation. In the study by Rowe, it was also found that 20 per cent of typewriting inaccuracies were due to errors of the non-letter type. In this experiment, 215 students were included in the experiment.

The following is taken from an article written by Clyde E. Rowe:[1]

> To be a successful typist, you must have more than the automatic control of the typewriter. It was discovered in an experiment that the more frequent an operation is performed, the greater will be the number of errors. These errors were controlled as much as possible in order to make the chances of error for each pupil equal.
>
> Two hundred and fifteen students were included in the experiment. Several high school teachers with varying experiences from two to twenty years checked every error separately for three months.
>
> Of the papers that were checked, the following interesting facts were noted:

Total errors	2198
Possible errors	11180
Inaccuracy	20 per cent
Range of errors	1-130
Medium number of errors	37
Medium inaccuracy	20 per cent

[1] Clyde E. Rowe, "Correcting Non-letter Errors in Typewriting," Journal of Business Education, (March 1931), Vol. 5, p. 30-31.

TYPE OF ERROR	NUMBER OF ERRORS	PERCENTAGE OF INACCURACY	RANK
Throwing the carriage			
1. Wrong finger position	68	32	11.0
2. Pushing instead of throwing	64	30	12.5
3. Whole arm instead of forearm	55	26	16.0
4. Looking away from copy when throwing carriage	63	29	14.0
5. Throwing carriage too hard (writing to left of margin)	15	7	41.5
6. Throwing carriage too lightly	11	5	43.5
Adjusting carriage			
7. Misreading carriage frame pointer on scale	91	42	5.0
8. Using space bar instead of carriage release levers	16	7	39.5
9. Using carriage release levers instead of space bar	82	38	7.0
10. Wrong fingering position on left carriage release lever	34	16	9.0
11. Wrong finger position on right carriage release lever	43	20	21.0
12. Does not know the number of horizontal spaces to the inch	110	51	3.5
Adjusting the paper			
13. Does not hold paper correctly to insert	42	20	23.5
14. Does not place paper against paper guide	11	5	43.5
15. Does not "twirl" cylinder knob	77	36	8.0
16. Does not know how to use paper release lever in adjusting paper	29	13	31.0

TYPE OF ERROR	NUMBER OF ERRORS	PERCENTAGE OF INACCURACY	RANK
Adjusting the paper (cont'd.)			
17. Removes paper without using paper release lever	24	11	34.5
18. Does not know how to move paper guide	33	15	30.0
19. Does not know position of paper guide to center paper	21	10	37.0
20. Uses wrong cylinder knob to move paper vertically	37	17	26.0
21. Does not know the number of "clicks" to an inch	49	23	18.0
22. Paper clamps not over the paper	24	11	34.5
23. Paper clamps too far over the edges of the paper	43	20	21.0
24. Cannot center paper	42	20	23.5
25. Cannot adjust for point of writing (variable line spacer, etc.)	130	60	1.0
Spacing on the page, vertically and horizontally			
26. Wrong number of spaces from the top of the paper	37	17	26.0
27. Wrong number of spaces between lines	22	10	36.0
28. Does not know how to move marginal stops	10	5	45.0
29. Cannot adjust marginal stops	2	1	50.0
30. Cannot figure centering	110	51	3.5
31. Does not know the number of vertical spaces to an inch	46	21	19.0
32. Does not know the number of horizontal spaces to an inch	70	33	10.0
33. Does not hear the bell	52	24	17.0

TYPE OF ERROR	NUMBER OF ERRORS	PERCENTAGE OF INACCURACY	RANK
Spacing on the page, vertically and horizontally (continued)			
34. Cannot operate marginal release controlling right margin	26	12	32.0
35. Moves marginal stop when writing to the left margin (left margin release)	72	33	9.0
Operating shift key and lock			
36. Moving hand out of position	36	17	28.0
37. Wrong finger on key	4	2	49.0
38. Looking at key	8	4	47.5
39. Release of shift before striking letter key	16	7	35.5
40. Letter key release too slow	8	4	47.5
Backspace key			
41. Moves hand out of position	111	52	2.0
42. Wrong finger on key	64	30	12.5
43. Looks at key	86	40	6.0
Tabular key			
44. Strikes key instead of holding it	15	7	41.5
45. Moves hand out of position	43	20	21.0
46. Looks at key	37	17	26.0
47. Wrong finger on key	17	8	38.0
48. Does not know the use of the tab key	1	0.5	51.5
Tabular Stops			
49. Misreads tabular scale	25	12	33.0
50. Cannot adjust tab stops	9	4	46.0

TYPE OF ERROR	NUMBER OF ERRORS	PERCENTAGE OF INACCURACY	RANK
Space bar			
51. Release too slow (type jumps spaces)	1	0.5	51.5
52. Does not bend thumb, keeps it straight and bends whole hand	56	26	15.0

Rowe's list of 52 non-letter typewriting errors which is found on the preceeding pages according to error classification will now be listed according to rank, beginning with the error most common and ending with the error which caused the least trouble.

TYPE OF ERROR	RANK
Cannot adjust for point of writing (variable line spacer, etc.)	1.0
Moves hand out of position	2.0
Does not know the number of horizontal spaces to the inch	3.5
Cannot figure centering	3.5
Misreads carriage frame pointer on scale	5.0
Looks at keys	6.0
Using carriage release levers instead of space bar	7.0
Does not "twirl" cylinder knob	8.0
Wrong fingering position on left carriage release	9.0
Moves marginal stop when writing to the left of the margin	9.0
Does not know the number of horizontal spaces to the inch	10.0

TYPE OF ERROR	RANK
Wrong finger position for throwing carriage	11.0
Wrong finger on backspace key	12.5
Pushes carriage instead of throwing	12.5
Looking away from copy when throwing carriage	14.0
Does not bend thumb, keeps it straight and bends whole hand	15.0
Throws carriage with whole arm instead of forearm	16.0
Does not hear the bell when spacing on the page both vertically and horizontally	17.0
Does not know the number of "clicks" to the inch	18.0
Does not know the number of vertical spaces to the inch	19.0
Paper clamps too far over the edges of the paper	20.0
Moves hand out of position when using tabular keys	21.0
Wrong finger position on right carriage release lever	22.0
Does not hold paper correctly to insert	23.5
Cannot center paper	23.5
Uses wrong cylinder knob to move paper vertically	24.0
Wrong number of spaces from top of paper when figuring centering	25.0
Looks at keys when tabulating	26.0
Moving hand out of position when operating shift key and lock	28.0
Does not know how to move paper guide	30.0
Does not know how to use paper release lever in adjusting paper	31.0

TYPE OF ERROR	RANK
Cannot operate marginal release controlling right margin	32.0
Misreads tabular scale	33.0
Removes paper without using paper release lever	34.5
Paper clamps not over the paper	34.5
Release of shift key before striking letter key	35.5
Wrong number of spaces between lines	36.0
Does not know position of paper guide to center paper	37.0
Wrong finger on tab	38.0
Using space bar instead of carriage release levers when adjusting the carriage	39.5
Throwing carriage too hard (writing to left of margin)	41.5
Strikes tabular key instead of holding it	41.5
Does not place paper against paper guide	43.5
Throwing carriage too lightly	43.5
Does not know how to move marginal stops	45.5
Cannot adjust tabulating stops	46.0
Looking at key while operating shift key and lock	47.5
Letter key released too slow	47.5
Wrong finger on key	49.0
Cannot adjust marginal stops	50.0
Does not know the use of tabulating key	51.5
Release too slow (type jumps spaces)	51.5

Rowe lists all non-letter typewriting errors, their causes, and remedial work as follows:

ERROR	CAUSE	REMEDIAL PROCEDURE
Throwing the carriage		
Looking away from the carriage	Lack of self-confidence	1
Uneven left margin		
After first line	Throwing carriage too hard, or too easy	1
At beginning	Failed to test margin before beginning to type	2
Adjusting carriage		
Misreading carriage indicator	Insufficient practice and interest in practice	3
Does not know the correct number of horizontal spaces to the inch	Insufficient practice	4
Adjusting paper		
Removes paper without using paper release	Belief that it is easier	Teacher activity Hold contest to eliminate noise practice
Does not know how to use paper release in adjusting paper	Insufficient practice in finding point of writing	6

ERROR	CAUSE	REMEDIAL PROCEDURE
Adjusting paper (cont'd.)		
Does not note position of paper both vertically and horizontally	Insufficient practice	7
Spacing on the page, both vertically and horizontally		
Cannot figure centering	Does not understand the problem involved	8
Does not know number of vertical strokes to the inch	Does not see connection between spaces and size of paper	9
Does not hear, or disregards bell - right margin error	Concentration of writing - bell acts as always	10
Tabulator key and stops		
Moves hand out of position	Lack of confidence in knowledge	11
Looks at tab keys	Lack of confidence in knowledge	11
Misreads tab scales in using stops	Does not test before using; infrequent use	12
Paragraphing inaccurate	Does not test tab stops	12
Space bar		
Does not bend thumb - keeps it straight. Moves whole hand	Believes it is easier follows least resistance	13

ERROR	CAUSE	REMEDIAL PROCEDURE
Space bar (cont'd.)		
Takes longer time to hit space bar than does keys		13
Miscellaneous		
Syllibication	Lack of knowledge of syllables	14
Position at machine - body, eyes, wrists, fingers, thumb	Does not believe these are important	Teacher activity Hold contest to eliminate noise practice

REMEDIAL PROCEDURES FOR NON-LETTER ERRORS

Number

1. Write an exercise of about 100 words of easy material (to focus attention of difficulty) with margins of 30 and 50, then one at 15 and 65, and then one at 5 and 75.

Trick device - type with stencil key using two sheets of paper and carbon papers.

2. Write a drill involving a number of settings of the left margin followed by striking a letter each time. Encourage the habit of testing the margin before beginning to type any assignment.

3. Write a drill which will result in a design of some sort if the points are correct, such as the following:

Double space; marginal stops at 5 and 75.

Write the letter x at the following points:

1st line - 18, 28, 58, 68
2nd line - 23, 33, 53, 63
3rd line - 28, 38, 48, 58
4th line - 33, 43, 53
5th line - 38, 48
6th line - 33, 43, 53
7th line - 28, 38, 48, 58
8th line - 23, 33, 53, 63
9th line - 18, 28, 58, 68

4. Write several lines, giving the directions in inches.

6. Write exercises involving sentences omitting letters, then removing the paper, then reinserting the paper and adjusting the paper to insert omitted letters.

Write a line of underscores, remove the paper, reinsert and write a sentence on the line. Repeat several times.

Initiate designs involving adjustment of paper

7. Manipulation drills, moving paper guide as far to the left as it will go, then centering words and sentences of whole and half sheets of paper.

8. Provide a mimeographed sheet explaining and illustrating the idea of placing the writing attractively framed by margins and the figuring, followed by several problems for which the answers are to be given.

9. Write several sentences with direction given in inches and half inches.

10. Write a rather long exercise with narrow margins, about 20 and 60. If this is ineffective, use 25 and 55.

11. Manipulation drill throwing the carriage, tabulating and writing letters or a word, then repeating. When used as a class drill, it may be timed.

12. Manipulation drill similar to above but setting the tabulator stops each time after writing the letters; 20 and 30 may be used as alternate line settings.

13. Write drills involving right-hand letters mostly, using letters as far from the thumb as possible followed by spaces, e.g.,;;; lll, etc.

14. Assign three and longer syllable words on the typewriter, with hyphens between them.

Copy exercises exactly as written with the words divided at the end of every line.

A short dictating assignment may be helpful.

Dr. William F. Book, after making a study of the types of mistakes found in various World's Championship Contests, reported the following classification:[1]

I. Location errors

a. Two keys struck at once

b. Imperfect location of keys

c. Substitution of one letter for another

1. Striking the key next to the correct one, with the wrong finger

2. Striking the key on the opposite side of the keyboard, but one which is in the same position row, such as e for i

3. Substitution due to incorrect spelling or inadequate control over the sequence of letter making movements

II. Controlling sequence of letter making movements

a. Anticipation of letters

b. Transposition of letters

c. Crowding

d. Piling

e. Addition or inserting of letters

f. Anticipation of a syllable or word and omission of the correct one.

g. Transposition of syllables or words or transposition of familiar phrases

[1] William F. Book, Learning to Typewrite, Gregg Publishing Company, New York, 1923, p. 242.

III. Errors in getting the copy

a. Deviations from the copy in punctuation, paragraphs, capitalization, etc.

b. Omission of words or parts of sentences

c. Insertion or addition of extra words or phrases

d. Substitution of a wrong word or phrase for the correct one.

IV. Errors in the manipulation of the machine

a. Failure to begin line at proper point

b. Inclined margin

c. Faulty and careless composition in special work

PAST WORK IN THE FIELD

Taken from Monograph 36. Methods of Teaching Typewriting by Lessenberry.[1]

In 1928, there was a study of 63,000 errors in an attempt to isolate major types of errors that are made by students at varying levels of speed.

This study was a mere listing of misstrokes. The study showed certain types of keyboard errors.

It was further found that unless remedial work was done, there was little significance attached to the discovery of errors.

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[1] D. D. Lessenberry, Monograph 36, South Western Publishing Company, 1937, p. 18.

"The first step in analyzing errors is the classification, in letters, of major writing difficulties. Typing errors may be classified rather broadly under the following headings:

A. Errors in stroking technique

1. Spasmodic typing that lacks flow or continuity
2. So-called rhymatic ruts (or a fixed typing rate) that sets the limit to speed development.
3. Inaccurate control of keys

B. Errors in basic knowledge or understanding

1. Missyllabication
2. Inaccurate form of expressing numbers
3. Incorrect, capitalization, punctuation, spelling and paragraphing.
4. Unacceptable arrangement of work
5. Failure to follow directions

C. Errors in manipulation or non-keyboard errors

1. Imperfect left margin
2. Imperfect shifting for capitals
3. Inaccurate alignment
4. Failure to space between words
5. Extra spacings between words
6. Extra spacings between letters
7. Lack of uniform indentations for paragraphs
8. Failure to immediately start typing the succeeding line after returning the carriage
9. Clashing of keys

D. Errors in reading copy that results in:

1. Changes in spelling, word sequence, punctuation, paragraphing, or use of capitals
2. Addition of word or phrase
3. Omission of word, phrase, or line
4. Transposition of words

"It is often impossible to know the exact cause of an error when it is studied apart from the student who made it.

"The best way of getting rid of typing errors is by correct typing habits. List technique difficulties daily, list errors in typewriting also but recognize the futility of retyping a word, a phrase, a line, or a paragraph unless the purpose of the retyping is fully understood. Practice, to improve, must be directed toward the specific improvement of a known writing difficulty."

Thelma Potter[1] believes that many errors could be avoided if the typist, before beginning to type, checked his machine for the proper adjustments. This would eliminate such non-letter errors as improper paragraph indentation due to previously set tabulator keys which are set incorrectly for the current problem, using single spacing when double spacing is required, and typing only capital letters due to the failure of checking the shift lock key. She further states that it would be wise for students to get into the habit of daily checking their machine before typing.

[1] Thelma Potter, "A preparation Check Sheet for Typists," Business Education World, Vol. 26, P. 252.

According to Robinson and Fitch,[1] the following non-letter errors are prevalent:

Touch

Rhythm

Skipping

Shifting

General typing

Repeated errors with the left hand

Repeated errors with the right hand

Syllabication

Piling at the right margin

Irregular left margin

Faulty use of the variable line spacer

Poor erasing

Erasing--if not permitted

Strikeovers

Placement

Failure to concentrate

Esby C. McGill[2] in an article in the Balance Sheet of October, 1943, lists errors that can be corrected through error analysis. It is an interesting list because of the peculiarity of the errors listed.

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[1] Eleanor Robinson and Marjorie Fitch, "Typewriting Check Sheet," Balance Sheet, Vol. 25, p. 123.

[2] Esby C. McGill, "Typewriting Error Analysis," Balance Sheet, October 1943, p. 62.

Added strokes--war(e)

Unaligned capitals - If

Transposition - teh

Inclining margins

Reading copy errors

Uneven touch

Incorrect finger location

Incorrect carriage location

Double letters - is(s)

Spacing within a word

Failure to indent for paragraphs

Light letters

Faulty spacing

Bunched errors

Piled letters well

Uneven left margin

Uneven right margin

Omission of letters

Mr. Nobel B. Morrison's thesis lists many non-letter typewriting errors all of which are mentioned by other authorities so no mention will be made of them here. He is of the opinion, and rightly so, that all errors are not equal in seriousness. He has attempted to classify these rrors as to various types of mistakes and the relative penalties which

should be applied to them.[1]

Although ignorance is a contributing factor in the reason for making non-letter errors, it certainly is not the only reason. The typist's mind-set has much to do with the results obtained. Indifference, carelessness, lack of initiative or forcefulness, and sluggishness will not turn out work of a good quality. If the teacher gives one the impression that his method of doing something is not the best, it will cause the students to lose faith in his instruction. Failure to automatize correctly will very likely cause errors.

Before remedial instruction can be given, the error must be located, and the cause of the error brought to light. The following suggestions will aid in establishing a proper attitude by the typist towards remedial instruction and will also make that instruction more meaningful:

1. Be sure that the student becomes aware of the error. It would be ideal for this error to be discovered by the typist himself because self discovery would really "bring home" this error to the student.

2. Create a desire within the student to correct this error. If nothing is done about correcting it, then valuable time will be wasted by remedial instruction.

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[1] Nobel B. Morrison, "An Evaluation of Errors in Typewriting," Master's Thesis, University of Iowa, 1930, p. 11.

3. Allow the student to provide his own remedial instruction if possible. This will be more lasting in his memory if he does the correcting. By means of trial by error, he might arrive at a suitable solution for solving his problem.

4. If the student cannot find a solution, then one must be provided by the teacher. It should be explained to the student and he should be made to see that that particular method is the correct one.

5. Require the typist to check daily on his errors. Motivation can be accomplished by observing a daily decrease in errors.

CHAPTER III

PROCEDURES USED IN GATHERING THE DATA AND RESULTS OF THE STUDY

There have been few surveys which are devoted entirely to non-letter errors in typewriting. After a careful examination of other theses inthe field of typewriting, it was decided that in order to fully understand and clarify the terms or technical words used, definitions needed to be given. The Dictionary of Education and Webster's Collegiate Dictionary (5th edition) were helpful.

Due to the specialized nature of this report, it was necessary to use all available library resources in the Boston area which included:

School of Education Library of Boston University

Teachers Room of the Boston Public Library

Henry Widener Library of Harvard University

The available information was recorded on index cards to provide ready reference in the study and classification of errors.

SOURCE OF ERRORS

It was decided that a five minute timed writing preferably on Kimball Contest Copy be given at the end of eighteen weeks' instruction to as many students as could be obtained for the experiment. To secure the material for error analysis, the purpose of the study was explained in a short talk by the

writer to a group of teachers attending a class in the Improvement of Instruction in Typewriting at Boston University. These teachers assisted by obtaining timed writings from students in their high school classes. None of the papers were identifiable with either students or teachers.

After the papers were submitted, they were scrutinized very carefully for errors. A tally sheet listing all possible non-letter typewriting errors and the number of occurrences thereof were made and recorded on the chart. In order to ascertain the percentage of non-letter errors to the total possible errors that could be made and detected (both letter and non-letter), it was necessary to correct and record all letter errors as well as to correct, record, and classify all non-letter errors.

After sampling one thousand papers which had approximately one hundred thousand words, it was believed this was an adequate sampling to insure an accurate picture of the correlation between letter and non-letter errors in typewriting.

Each individual error was scored and the total recorded to the name of the error. The total number of errors made was 11,256. Actually, this amounted to 11.25 errors per paper or 2.25 errors per minute per paper.

According to the research available, eighty-five non-letter errors were possible. Only forty errors were used in the study. (see list, page 49). Inasmuch as many of the errors listed could only be discovered by actually observing the

typist at work, these errors were labelled as "Undetected Errors." (See list, page 50) The timed writings were analyzed and proofread for all possible errors detectable by examination. For example, listed as one of the possible non-letter errors was "Jerks paper from machine without using paper release lever." This error could only exist on any one of the thousand papers that were checked and still remain undiscovered simply because the error can only be apparent by actually observing the typist jerk the paper from the machine without using the paper release lever. According to research workers in typewriting, there are approximately forty-five errors of this type.

After the results were compiled, various tables were organized showing the relationship between the total number of errors (11,256) as compared to total letter errors (6221) and total non-letter errors (5035). Percentages were compiles of each individual error and its relation to total non-letter errors. The relative importance and frequency was also determined of each non-letter error in comparison to the major over-all error classification. For example, Manipulation Errors, Mental Errors, and Lack of Knowledge Errors were computed and their relationship between the total errors (11,256) and non-letter errors (5035) was shown.

RESULTS OF ERROR FREQUENCY COUNT

The following are the results of the error frequency count conducted throughout various high schools in and around Boston, Massachusetts.

Table I contains the most frequently occurring non-letter errors. It was determined that any error occurring ninety-nine times or more would be considered as having a high percentage of frequency.

TABLE I

NON-LETTER ERRORS OCCURRING

MOST FREQUENTLY IN THE ERROR COUNT

Classification of Errors	Number of Errors	Percentage of Total Errors
Incorrect spacing within a line	740	6.60
Omission of letters	685	6.10
Striking keys too lightly	487	4.30
Faulty Shifting	362	3.21
Transposition of letters	360	3.20
Failure to space between words	311	2.76
Strikeovers	271	2.40
Uneven left margin	262	2.32
Substitution of correct for incorrect word	140	1.25
Incorrect paragraphing	129	1.15
Crowding of letters	126	1.11

INTERPRETATION OF THE RESULTS

In reference to Table I, it was interesting to note that incorrect spacing within a line leads all other non-letter errors. This includes the following manipulative errors:

Incorrect spacing between letters

Incorrect spacing between words

Incorrect spacing between sentences

Of the 5035 non-letter errors, manipulative errors caused the greatest amount of difficulty, contributing 29 per cent of the errors. This was followed by mental errors which caused 12 per cent of the difficulty. In the third group, 3 per cent of the errors were caused by lack of knowledge of the typewriter. This would mean that of all the errors in this study (11,256) almost 30 per cent (3284 errors) could be classified as manipulation errors.

The second table consists of errors according to their classification in the non-letter group.

TABLE II

CLASSIFICATION OF ERRORS IN TYPEWRITING

Classification of Errors	Number of Errors	Per Cent of Errors
Letter Errors (Lack of locality security)		
Incorrectly struck letters	5710	50.72
Lack of control resulting in double or added letters	511	4.54
	6221	55.26
Manipulation Errors		
Incorrect spacing within a line	740	6.60
Striking keys too lightly	487	4.30
Faulty shifting	362	3.21
Failure to space between words	311	2.76
Uneven left margin	262	2.32
Incorrect paragraph indentation	129	1.15
Crowding letters	126	1.11
Uneven touch	97	.90
Fingers not on home keys	80	.71
Raised letters	77	.70
Overrun line	72	.61
Striking keys with too much force	67	.59
Short line	65	.57
Faulty capitalization	59	.52
Does not hear or disregards bell	54	.50
Incorrect spacing between lines	53	.50
Piling letters at end of line	48	.41
Failure to indent for paragraphs	48	.41
Uneven margins	35	.31
Failure to capitalize	35	.31
False start	26	.23
Right margin incorrectly set	19	.16
Failure to space between sentences	14	.14
Paper not straight in machine	11	.10
Left margin incorrectly set	5	.05
Inclined left margin	2	.01
	3284	29.18

TABLE II (Concluded)

Classification of Errors	Number of Errors	Per Cent of Errors
Mental Errors		
Omission of letters	685	6.10
Transposition of letters	360	3.20
Substitution of correct word for incorrect word	140	1.25
Repetition of word	55	.51
Omission of words or parts of sentence	52	.46
Errors in reading the copy	41	.35
Addition of word, phrase, or line	25	.20
	1358	12.07
Lack of Knowledge		
Strikeovers	271	2.40
Improper division of words	73	.64
Failure to follow directions	32	.30
Faulty and careless arrangement of work	11	.10
Erasing, if not permitted	6	.5
	393	3.49
Recapitulation		
Letter Errors	6221	55.26
Manipulation Errors	3284	29.18
Mental Errors	1358	12.07
Lack of Knowledge	393	3.49
	11256	100.00

TABLE III

ALPHABHETIC TABLE OF DETECTABLE ERRORS

Arrangement, faulty and careless
Bell, fails to hear or disregards
Capitalization, faulty
Capitalize, failure to
Copy, error in reading
Control, lack of resulting in double or added letters
Directions, failure to follow
Erasing, if not permitted
Fingers not on home keys
Keys, striking with too much force
Keys, striking too lightly
Letters, crowding of
Letters, incorrectly struck
Letters, omission of
Letters, piling of
Letters, raised
Letters, transposition of
Line, overrun
Line, short
Left margin, failure to set
Left margin, inclined
Left margin, uneven
Right margin, failure to set
Paper, not straight in
Paragraph, incorrect indentation of
Paragraph, failure to indent for
Shifting, faulty
Spacing, failure between sentences
Spacing, failure between words
Spacing, incorrect within a line
Spacing, incorrect between lines
Start, false
Strikeover
Touch, uneven
Words, addition of
Words, improper division of
Words, omission of
Words, substitution of correct for incorrect
Words, repetition of

The fourth table consists of errors according to their frequency. They are listed from their highest to their lowest frequency. The name of the error appears and in each case is followed by the number of times it occurred in this study.

One thousand papers containing five-minute timed writings were carefully checked. There was an average of 11.25 errors per paper or 2.25 errors per minute.

TABLE IV

FREQUENCY OF DETECTABLE ERRORS

Error	Number of Errors	Per Cent of Errors
Incorrectly struck letters	5710	50.72
Incorrect spacing within a line	740	6.60
Omission of letters	685	6.10
Lack of control resulting in double or added letters	511	4.53
Striking keys too lightly	487	4.30
Faulty shifting	362	3.21
Transposition of letters	360	3.20
Failure to space between words	311	2.76
Strikeovers	271	2.40
Uneven left margin	262	2.32
Substitution of correct word for incorrect word	140	1.25
Incorrect paragraphing	129	1.15
Crowding of letters	126	1.11
Uneven touch	97	.90
Fingers not on home row of keys	80	.71
Raised letters	77	.70
Improper division of words	73	.64
Overrun line	72	.61
Striking keys with too much force	67	.59
Short line	65	.57
Faulty capitalization	59	.52
Repetition of word	55	.50

TABLE IV (Concluded)

Error	Number of Errors	Per Cent of Errors
Does not hear or disregards bell	54	.50
Incorrect number of spaces between lines	53	.50
Omission of words or parts of sentences	52	.46
Failure to indent for paragraphs	48	.41
Piling of letters at end of line	48	.41
Errors in reading copy	41	.35
Uneven margins	35	.31
Failure to capitalize	35	.31
Failure to follow directions	32	.29
False start	26	.23
Addition of word, phrase, or line	25	.20
Failure to set right margin	19	.16
Failure to space between sentences	14	.14
Faulty and careless arrangement of work	11	.10
Paper not straight in machine	11	.10
Erasing if not permitted	6	.06
Failure to set left margin	5	.05
Inclined left margin	2	.01
	11,256	100.00

The fifth table shows all the non-letter errors and their importance to the total number of non-letter errors. They are listed in their order of rank from the most frequent to the least frequent errors. The non-letter errors number 5035.

TABLE V

NON-LETTER ERRORS AS FOUND IN

ONE HUNDRED THOUSAND RUNNING WORDS

Error	Number of Errors	Per Cent of Errors
Incorrect spacing within a line	740	14.70
Omission of letters	685	13.61
Striking keys too lightly	487	9.67
Faulty shifting	362	7.19
Transposition of letters	360	7.15
Failure to space between words	311	6.18
Strikeovers	271	5.38
Uneven left margin	262	5.20
Substitution of correct for incorrect	140	2.78
Incorrect paragraph indentation	129	2.56
Crowding of letters	126	2.50
Uneven touch	97	1.93
Fingers not on home keys	80	1.59
Raised letters	77	1.53
Improper division of words	73	1.43
Overrun line	72	1.43
Striking keys with too much force	67	1.33
Short line	65	1.29
Faulty capitalization	59	1.17
Repetition of words	55	1.09
Does not hear or disregards bell	54	1.07
Incorrect spacing between lines	53	1.05
Omission of words	52	1.03
Failure to indent for paragraphs	48	.95
Piling of letters at end of line	48	.95
Errors in reading copy	41	.81
Uneven margins	35	.70
Failure to capitalize	35	.70
Failure to follow directions	32	.64
False start	26	.52
Addition of word	25	.50
Failure to set right margin	19	.38
Failure to space between sentences	14	.28
Paper not straight in machine	11	.22
Faulty and careless composition	11	.22
Erasing if not permitted	6	.12
Failure to set left margin	5	.10
Inclined left margin	2	.04
	5035	100.00

TABLE V (Concluded)

Error	Number of Errors	Per Cent of Errors
Manipulation errors	3284	65.23
Mental errors	1358	26.98
Lack of Knowledge errors	393	7.79
	5035	100.00

The sixth table shows the following information:

Column 1 shows the total number of non-letter errors found in this study of one hundred thousand running words.

Column 2 shows the per cent of each non-letter error in relation to the total number of non-letter errors (5,035) found in this study.

Column 3 shows the per cent of each non-letter error in relation to the total errors (11,256) found in this study.

TABLE VI

PERCENTAGE OF ERRORS IN RELATION TO

NON-LETTER ERRORS AND TOTAL ERRORS (11,256)

Error	Column 1	Column 2	Column 3
Letter			
Incorrectly struck letters	6221		55.25

TABLE VI (Continued)

Error	Column 1	Column 2	Column 3
Manipulation			
Incorrect spacing within a line	740	14.70	6.60
Striking keys too lightly	487	9.67	4.30
Faulty shifting	362	7.19	3.21
Failure to space between words	311	6.18	2.76
Uneven left margin	262	5.20	2.32
Incorrect paragraph indentation	129	2.56	1.15
Crowding of letters	126	2.60	1.11
Uneven touch	97	1.93	.90
Fingers not on home keys	80	1.59	.71
Raised letters	77	1.53	.70
Overrun line	72	1.43	.61
Striking keys with too much force	67	1.33	.59
Short line	65	1.29	.57
Faulty capitalization	59	1.17	.52
Does not hear or disregards bell	54	1.07	.50
Incorrect spacing between lines	53	1.05	.50
Failure to indent for paragraphs	48	.95	.41
Piling of letters at end of line	48	.95	.41
Uneven margins	35	.70	.31
Failure to capitalize	35	.70	.31
False start	26	.52	.23
Failure to set right margin	19	.38	.16
Failure to space between sentences	14	.28	.14
Paper not straight in machine	11	.22	.10
Failure to set left margin	5	.10	.05
Inclined left margin	2	.04	.01
	3284	65.23	29.18
Mental			
Omission of letters	685	13.61	6.10
Transposition of letters	360	7.15	3.20
Substitution of correct word for incorrect word	140	2.78	1.25
Repetition of word	55	1.09	.50

TABLE VI (Concluded)

Error	Column 1	Column 2	Column 3
Mental (Concluded)			
Omission of word or parts of sentences	52	1.03	.46
Errors in reading the copy	41	.81	.35
Addition of word, phrase, or line	25	.50	.20
	1358	26.97	12.06
Lack of Knowledge			
Strikeovers	271	5.38	2.40
Improper division of words	73	1.43	.64
Failure to follow directions	32	.64	.29
Faulty and careless arrangement of work	11	.22	.10
Erasing if not permitted	6	.12	.06
	393	7.79	3.49
Recapitulation			
Letter Errors	6221		55.26
Manipulation Errors	3284	65.23	29.18
Mental Errors	1358	26.98	12.07
Lack of Knowledge Errors	393	7.79	3.49
	11256	100.00	100.00

Table VII illustrates the values of the various individual percentages of non-letter errors in relation to the total number of errors within their own classification.

TABLE VII

PERCENTAGE OF NON-LETTER ERRORS IN RELATION TO TOTAL NUMBER OF ERRORS WITHIN THEIR OWN CLASSIFICATION

Classification of Errors	Number of Errors	Per Cent of Errors
Manipulation Errors		
Incorrect spacing within a line	740	22.53
Striking keys too lightly	487	14.83
Faulty shifting	362	11.02
Failure to space between words	311	9.47
Uneven left margin	262	7.98
Incorrect paragraph indentation	129	3.93
Crowding of letters	126	3.84
Uneven touch	97	2.96
Fingers not on home keys	80	2.44
Raised letters	77	2.35
Overrun line	72	2.20
Striking keys with too much force	67	2.04
Short line	65	1.98
Improper capitalization	59	1.79
Does not hear or disregards bell	54	1.64
Incorrect spacing between lines	53	1.61
Failure to indent for paragraphs	48	1.46
Piling of letters at end of line	48	1.46
Uneven margins	35	1.07
Failure to capitalize	35	1.07
False start	26	.79
Failure to set right margin	19	.58
Failure to space between sentences	14	.43
Paper not straight in machine	11	.33
Failure to set left margin	5	.15
Inclined left margin	2	.06
	3284	100.00
Mental Errors		
Omission of letters	685	50.44
Transposition of letters	360	26.51
Substitution of correct for incorrect	140	10.31
Repetition of words	55	4.05
Omission of words	52	3.83
Errors in reading the copy	41	3.02
Addition of words	25	1.84
	1358	100.00

TABLE VII (Concluded)

Classification of Errors	Number of Errors	Per Cent of Errors
Lack of Knowledge		
Strikeovers	271	68.96
Improper division of words	73	18.58
Failure to follow directions	32	8.15
Faulty and careless composition	11	2.80
Erasing if not permitted	6	1.51
	393	100.00

The following is a list of all known typewriting errors, as compiled from known research, of errors which are detectable from observing the typed paper.

LIST I

DETECTABLE ERRORS

Paper not straight in machine
Short line
Overrun line
Incorrect spacing within a line
Incorrect division of words
Striking keys too lightly
Striking keys with too much force
Piling of letters at end of line
Faulty and careless arrangement of work
Erasing if not permitted
Uneven left margin
Right margin incorrectly set
Left margin incorrectly set
Inclined left margin
Uneven margins
Strikeovers
Failure to indent for paragraphs
Incorrect paragraph indentation

LIST I (Concluded)

Transposition
Uneven touch
Does not hear or disregards bell
Addition of word, phrase, or line
Repetition of word
Failure to follow directions
Omission of words or parts of sentence
Lack of control resulting in double or added letter
Faulty shifting
Substitution of correct word for incorrect word
Errors in reading the copy
Incorrectly struck letters
Raised letter
Omission of letters
Crowding of letters
Failure to space between words
Failure to capitalize
Improper capitalization
False start
Fingers not on home keys
Failure to space between sentences
Incorrect number of spaces between lines

The following is a list of errors that could only be detected by actually observing the typist at work and therefore have not been included in this study.

LIST II

UNDETECTABLE ERRORS

Does not know how to move paper guide
Does not know how to use paper guide
Jerks paper from machine without using paper release lever
Does not put left edge of paper against paper guide
Does not hold paper correctly to insert
Paper clamps not over the paper
Does not know how to use paper release lever for aligning paper
Pushing carriage instead of throwing

LIST II (Concluded)

Throws carriage with whole body instead of with wrist
Looks away from copy when throwing carriage
Wrong fingering position on left carriage release lever
Wrong fingering position on right carriage release lever
Misreads carriage frame pointer on scale
Lingers on keys
Wrong position at typewriter
Adjusts ribbon reverse lever on Red to avoid changing ribbon
Wrong fingering position
Does not move carriage to the side when erasing
Using space bar instead of carriage release lever
Using carriage release lever instead of space bar
Does not twirl cylinder knob when inserting paper
Uses incorrect finger for operating marginal release key
Cannot adjust marginal stops
Does not adjust marginal stops
Moves marginal stops instead of depressing marginal release key when writing to left of margin
Improper method of erasing
Releases space bar too slowly causing carriage to jump
Does not hit space bar in the middle
Moves hand out of position when striking space bar
Unable to type on lined paper
Wrong finger on shift key
Moves hand out of position when using shift key
Does not understand how to use tabular stops
Wrong finger on tabular key
Moves hand out of position when using tabular key
Misreads tabular scale
Looks at keyboard
Failure to immediately start typing after throwing carriage
Uses wrong cylinder knob to move paper vertically
Does not know the correct number of horizontal spaces to the inch
Does not know the correct number of vertical spaces to the inch
Moves hand out of position when striking backspace key
Uses first finger for backspace key
Does not know how to figure centering problems
Clashing of keys

CHAPTER IV

REMEDIAL EXERCISES

It has been found in this study, those errors which proved troublesome one thousand five-minute timed writings. These errors were given percentages equivalent to their order of difficulty when compared to the total number of errors.

Remedial exercises have been presented for each of the errors that were tabulated.

It is suggested that after the proper diagnosis had been given of the typist's difficulty, the following remedial drills should be given.

Addition of words, phrase, or line (Mental Error)

Cause: Constant glancing from copy to typewriter and back again to the copy; reading ahead of copy and becoming confused; becoming confused due to watching the typed copy; inattention; poor automatization.

Remedial work: Keep only one or two words ahead of copy; be mentally conscious of all words typed; place copy in clear view (opposite side to the carriage return lever); assign difficult material to force typist to keep his eyes on the copy.

Crowding of letters (Manipulation Error)

Cause: Uneven touch; sudden increase in speed; irregular timing.

Remedial work: drill on having an evenness of touch. Explain that this will do away with "crowding" errors.

Does not hear or disregards bell (Manipulation Error)

Cause: Poor hearing; bell not ringing; fails to understand purpose of bell; tries to squeeze in letters before keys lock.

Remedial work: Repair bell if defective; teach student to shut out all other sounds as he types so that he will hear bell when it rings; explain purpose of the bell--it is a warning that the end of the line is near and the carriage must be thrown at the first opportunity.

Erasing if not permitted (Lack of Knowledge Error)

Cause: Fear of being penalized for errors.

Remedial work: Explain how erasing takes up much time and distracts from the appearance of the paper.

Errors in reading the copy (Mental Error)

Cause: Inattentiveness; carelessness.

Remedial Work: Pay closer attention to copy.

Failure to capitalize (Manipulation Error)

Cause: Did not hold down shift key; released shift key before striking letter; inattentiveness.

Remedial work: Teach and demonstrate proper method of shifting for capital letters; exercise by typing the following: aAa bBb cCc dDd eEe, and continue on through the alphabet--be sure that these letters are all on one line.

Failure to follow directions (Lack of Knowledge Error)

Cause: Failure to check machine before typing.

Remedial work: Pay closer attention to directions; instill in the typist the habit of always checking his machine before beginning to type to see that he has the proper machine adjustments.

Failure to indent for paragraphs (Manipulation Error)

Cause: Inattentiveness; forgetting to depress tab key; does not understand rules for paragraphing; failure to hold tab key down until carriage stops moving. Does not understand purpose of tab key.

Remedial work: Explain the rules for paragraphing; demonstrate correct method of depressing tab key (hold down until carriage stops).

Failure to set left margin (Manipulation Error)

Cause: Forgetting to set left margin properly; does not know how to set left margin; defective left marginal stop.

Remedial work: Explain and demonstrate how to set left margin. Exercise: Set left margin for 10 and type a few words. Change margin to 20 and type a few more words. Repair left margin if defective; emphasize to typist the importance of checking typewriter for the proper machine adjustments before typing.

Failure to set right margin (Manipulation Error)

Cause: Does not set right margin properly; does not know

how to set right margin; defective right marginal stop.
Remedial work: Explain and demonstrate how to set right margin. Exercise: Set margin for 10-75. Type a few lines and set margins for 20-65. Type a few more lines and set margins for 30-55. Repair right marginal stop if defective.

Failure to space between sentences (Manipulation Error)
Cause: Typist in too great a rush to get material typed; does not operate space bar correctly; does not understand the rules for spacing after a period, semicolon, question mark, colon, and exclamation point.
Remedial work: Explain rules of punctuating after sentences.
Drill: Give students typed sentences without spaces between words or between sentences. Have typist type it correctly.

Failure to space between words (Manipulation Error)
Cause: Light touch on space bar; faulty carriage (sticks); hesitation by student sometimes causes him to forget whether or not he spaced between words--as a result, he spaces an extra time; thumb resting on space bar; typist anxious to continue.
Remedial work: Practice striking space bar sharply so that it spaces only once. Keep thumb off space bar until actual time to space. Be conscious of spacing or not spacing between words. Give exercise containing brief words. Have student type them. He is to consider that no word is complete until the space bar has been struck. As he types the

sentence call out at intervals--STOP. He is to stop after typing word and space and is to continue again upon signal. If necessary, clean machine.

False start (Manipulation Error)

Cause: Typing before proper time; nervousness of typist; fingers resting on keys causing impressions to be typed accidentally on paper; makes too many mistakes and starts over; fails to set margins and after discovering error, starts over again.

Remedial work: Emphasize how much time is wasted by starting over; try to instill the habit of a Right Start the First Time.

Faulty and careless arrangement (Lack of Knowledge Error)

Cause: Inattentiveness to directions, lack of indifference by typist.

Remedial work: Try to get typist to get pride into his work; stress neatness and accuracy; show examples of neat appearing work.

Faulty capitalization (Manipulation Error)

Cause: Forgetfullness; inattention; anticipation.

Remedial work: Have typist pay closer attention to material being typed. Type a paragraph containing many capital letters:

John and Mary visited the Lincoln Homestead,
Grant's Tomb, the Pentagon, and the White House.

Faulty shifting (Manipulation Error)

Cause: Finger resting on shift key; shift key not entirely depressed; shift key released too soon; typist in too great a hurry to proceed, thus slurring his movement.

Remedial work: Check position of hands on home row. Demonstrate proper method of typing capital letters. Exercises: Ha Ha Harry; Al Al Alfred; Su Su Susan; check to see that these letters are all on line. This drill could be applied to any letter by simply changing the name to fit the letter. Caution typist to take time to make capital letters. Show him material containing faulty shifting errors and point out its unattractiveness.

Fingers not on home keys (Manipulation Error)

Cause: Removing entire hand from home row when using space bar or shift key; does not keep fingers curved over home row; does not check for correct position of hands after throwing carriage.

Remedial work: Explain and demonstrate correct position of hands on keyboard; explain and demonstrate correct method for using shift key, space bar, and the proper carriage throw; until the typist overcomes his difficulty, have him check the position of his fingers at the beginning of each row and before typing any letters.

Improper division of words (Lack of Knowledge Error)

Cause: Lack of knowledge of syllibication; failure to hyphenate correctly.

Remedial work: Have typist read up on rules for syllabication; acquire the dictionary habit; explain that if a word is divided, the hyphen is placed at the end of the line and not carried over to start the beginning of the succeeding line.

Inclined left margin (Manipulation Error)

Cause: Faulty left marginal stop; uneven throwing of carriage; paper reinserted into typewriter incorrectly.

Remedial work: Repair marginal stop if defective; practice throwing the carriage; attain even carriage throw; teach and demonstrate correct method for aligning paper on paper scale after it has been removed from typewriter.

Incorrect paragraph indentation (Manipulation Error)

Cause: Does not set tabulator stop correctly. Fails to use tabulator stop for paragraph indentations but instead, thumbs over the required number of times. Uses tabular stop but releases it before carriage stops moving. Fails to set tabular stops. Does not know where paragraph should begin.

Remedial work: Explain purpose of tabular stop and demonstrate the correct way of setting them. Explain that tab stop must be held all the way down until carriage stops before removing finger from it. Exercise: Set tab stop for 5 space indentation. Depress tab key; check it for accuracy. Set left margin for 19 and tabs for 41 and 63. Type the at left margin, depress tab key and type the at first tab

stop. Depress tab key and type the at second tab stop. Do five lines of this drill. Explain to the student the rules for deciding when one paragraph should end and another paragraph should begin.

Incorrect spacing between lines (Manipulation Error)

Cause: Failure to set line space adjusting lever to correct spacing desired. Typing a few lines and then setting line lever to correct number. Incorrect carriage return. Paper release lever not in its home position causing paper to slip.

Remedial work: Explain that a good typist always sets and checks his machine before beginning to type. For a drill, set machine for single spacing--type two lines. Set for double spacing--type two lines. Set for triple spacing--type two lines.

Incorrect spacing within a line (Manipulation Error)

Cause: Using space bar at wrong time due to lack of control. The typist's muscles are not coordinated as best they could. Another cause is that striking the keys too lightly will sometimes cause the carriage to skip. A slow release of a key will also cause the carriage to skip. The thumb might be resting against the space bar. The typist might transpose the space after a word and the last letter of the word.

Remedial work: Spell out letters as they are typed. Strike keys with an even stroke and release the keys quickly using the "snatch" method. Keep thumb off space bar except when spacing between words.

Incorrectly struck letters (Letter Error)

Cause: Lack of control resulting in double or added letter.

Example: was (s), war (e). Improper reach; reading too far ahead in the copy; shifting eyes from copy to typewriter; watching fingers or paper as you type; lack of concentration.

Remedial work: Use a textbook different from the one being used by the typist in difficulty. Caution typist to type at a rate of speed at which he feels confident in his ability to strike the proper keys; practice the reach letters such as t, y, b, v, m, n, 6, 7. Keep eyes on copy at all times; keep only one word ahead of your fingers.

Omission of letters (Mental Error)

Cause: Reading too far ahead in the copy; thinking that letter has already been typed; slurring letters; striking keys too lightly to make an impression on the paper.

Remedial work: Pay closer attention to copy; concentrate on each letter being typed; do not read too far ahead in the copy; give more attention to equal weight of each stroke; slow down speed.

Omission of word or parts of sentence (Mental Error)

Cause: Inattention; copy placed on wrong side of typewriter cutting off partial view; reading copy too far ahead; eye skips one line; removes eyes from copy and loses place; poor eyesight.

Remedial work: Place copy in plain view; caution typist

about reading too far ahead. Keep eyes on copy. If typist has poor eyesight, he should consult an eye doctor.

Overrun line (Manipulation Error)

Cause: Disregards or fails to hear bell causing keys to lock or letters to pile up on each other at end of line; attempts to type too much on one line causing a constant use of the marginal release key.

Remedial work: Explain the purpose of the bell. It is a warning that the end of the line is near. The typist must return the carriage at the earliest opportunity--either after typing the next word, or if it is too long, to hyphenate it and then return the carriage. Exercise: Practice typing a line, have the bell ring, and let typist decide what is the proper thing to do.

Paper not straight in machine (Manipulation Error)

Cause: Failure to have left edge of paper against paper guide; also due to rolling paper into machine instead of twirling the cylinder knob.

Remedial work: Explain and demonstrate the purpose of the paper guide. Have the following drill: 1--Hold paper in left hand, place left edge of paper against paper guide and have thumb and first and second fingers of right hand on right cylinder knob. 2--Twirl knob and place paper bail against paper in cylinder. 3--Remove paper by using paper release. Teach proper method of aligning paper by means of

paper release lever and alignment scale.

Piling of letters at end of line (Manipulation Error)

Cause: Typing beyond the bell causing a striking over of letters; faulty line lock; does not hear bell; obstruction on left of carriage causing letters to pile up on each other.

Remedial work: Explain that four to six strokes can be struck after the bell rings; make typist bell conscious; set margins for 20-50; type a paragraph; have student listen for the bell and hyphenate all words coming near the end of line; clear all obstructions from typewriter.

Raised letters (Manipulation Error)

Cause: Finger striking key slips and partially depresses shift key while striking letter key; other fingers resting on shift key; failure to release shift key after typing capital letter.

Remedial work: Practice typing words beginning with capitals; caution typist against fingers resting against shift key.

Repetition of word (Mental Error)

Cause: Over concentration of thought; forgetting that word has already been typed after lapse in typing.

Remedial work: Pay closer attention to the copy; Avoid lapses in typing.

Short line (Manipulation Error)

Cause: Due to nervousness and anticipating the carriage throw upon completion of the line; student fears line will

be too long and throws carriage prematurely.

Remedial work: Explain to student that there should be a full line of typed characters before carriage is thrown. Slow down speed of typist, thereby relieving his tenseness. Have him type at a smooth even rate and throw carriage at first opportunity after the sound of the bell. Give practice in waiting for the bell to ring so that he will know exactly when it will ring.

Strikeovers (Lack of Knowledge Error)

Cause: Trying to avoid erasing or rewriting error by striking another character over the original character. This shows that the student is aware of an error being made.

Remedial work: Penalize heavily for strikeovers. Explain that by striking over time is wasted because it means that after the incorrect has been struck, the typist must depress the backspace key, type the proper character, and continue with the copy.

Striking keys too lightly (Manipulation Error)

Cause: Lack of confidence as to whether the correct key will be struck (locational security). Sometimes due to excessive speed; touch control not fitted to the typist; slurring keys; weak fingers, long fingernails.

Remedial work: Slow down speed to a steady confident pace and acquire an even touch. Give more attention to striking each key with the same amount of weight. Have drills similar

to the following:

asdfg ;lkjh asdfg ;lkjh asdfg ;lkjh asdfg ;lkjh asdfg ;lkjh

and

Now is the time for all good men to come to the aid of their party.

Adjust touch control lever.

Striking keys with too much force (Manipulation Error)

Cause: The home row of keys usually is the one that is struck too heavily because they are the keys that are best known and most often used on the keyboard; some fingers stronger than others; incorrect adjustment of the touch control lever.

Remedial work: Caution typist against striking home row with too much force; type words such as alfalfa, single, dirge, fulfillment, garden, local, alkalai, adjustment, hallow, Roslindale, asking, lash, kalo. Adjust touch control lever if necessary.

Substitution of correct word for incorrect word (Mental Error)

Cause: Mental interchanging of words; inability to spell a word.

Remedial work: Read copy more closely.

Transposition of letters (Mental Error)

Cause: Reading too far ahead in the copy; misreading copy; faulty automatization; typing beyond typist's control; thinking about the space and striking the space bar before the

last letter is struck; difficult combinations of letters; poor spelling ability.

Remedial work: Determine which combinations are causing the greatest trouble. When these combinations again make their appearance, type on the letter level until the difficulty is passed, then resume normal speed. Keep reading down to only one or two words in advance of typing speed. Consult a dictionary when in doubt as to the correct spelling of a word.

Uneven left margin (Manipulation Error)

Cause: Does not know correct amount of power needed for returning carriage; fears carriage will not be entirely returned; does not snap wrist but uses whole arm when throwing carriage; pushes carriage instead of throwing it; faulty left marginal stop.

Remedial work: Teach and demonstrate correct arm and hand position for throwing carriage; set margins for 10-75 and have carriage pointer indicator on 60. Type the following drill:

and go in a

measure to make up the

Repeat drill as many times as necessary. Another drill is to have narrow columns requiring typist to throw carriage very frequently.

Uneven margins (Manipulation Error)

Cause: Does not understand how to set margins; does not know how to figure length of line; carelessness in setting marginal stops; paper guide not correctly set; left edge of paper not against paper guide.

Remedial work: Point out to student how unbalanced work appears if it does not have a "picture frame" effect; explain and demonstrate how to set margins properly. If the student finds it difficult to set the margins on his machine, transfer him to a different model. Explain how to determine margins, total strokes of line subtracted from total strokes of paper divided by two; check marginal stops to see if they are in working order; explain the importance of the paper guide and demonstrate correct method of inserting paper into the machine.

Uneven touch (Manipulation Error)

Cause: Alternating light and heavy touch giving uneven color to the typed letters; due to excessive speed, using strong fingers for words such as the, and; typing difficult combinations of letters.

Remedial work: Slow down excessive speed; type to music to establish rhythm.

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APPENDIX A

AN EXAMPLE OF KIMBALL CONTEST COPY

THE STORY OF MAUD

J. N. Kimball

The summer of the camper and the tourist, the summer that empties the cities to such an extent as to give one a dime idea that some grim malady is abroad in the land and that the people have shut up their homes and fled to escape its ravages, had gone. This change in the seasons is marked by no sudden tumult in nature, for the skies are as bright and the heat as oppressive as before; but it seems to rest mainly on the calendar.

On the last day of August you may wander up and down the byways of a large city like New York and marvel as to what has become of all the human beings who crowd those streets and go in a measure to make up the vastness of the place. But, lo, all you have to do is to tear off one sheet from the calendar; and, as if by magic and like shaking the carpet of the fabled genious of old, all is changed. Again the lights gleam and glitter along the Great White Way; again the sound of music can be heard as you pass the open door of every cafe; again you are pushed and jammed and jostled on the sidewalk; again you attempt to cross the street you put your hand in your vest pocket to be sure that your accident policy is all right, for you feel certain

that you will need it before you reach the other side; and again the hat of straw and the suit of flannel are laid aside for another year, or if worn in defiance of custom they excite in the passing crowd ribald comments or sarcastic grins.

What does it all mean: Only that one season has ended and that another is at hand, that summer has gone in the winking of an eye and all because of the one sole and apparent reason that you have torn another sheet from the calendar. Verily, man is the creature of habit.

APPENDIX B

EXTRACTS FROM INTERNATIONAL CONTEST RULES

1. Line spacing. Work must be double spaced--"two notches." Every line wrongly spaced is penalized one error in addition to all other errors in the same line.

2. Length of line. Except at end of paragraph, any line having fewer than 61 or more than 76 characters and spaces is penalized one error in addition to all other errors in the same line.

3. Length of page. With paper "8-1/2 by 13" each page, except the last, must have at least 35 lines of writing; with paper "8-1/2 by 11" each page, except the last, must have at least 29 lines of writing. One error is charged for short page--not one error for each line that page is short.

4. Paragraphing. Paragraphs must be indented five spaces, and only five. An error in paragraphing is penalized in addition to all others in same line.

5. Spaces and Punctuation Points. All spaces and punctuation points are treated as parts of the preceeding word, but if incorrectly made, inserted, omitted, or in any manner changed from the printed copy, an error must be charged unless the preceeding word has already been penalized. (See rule No. 6.)

6. Spacing after Puntuation. Two spaces must follow the period, the colon, the interrogation, the exclamation points. If punctuation is followed by a quotation mark, the spacing follows the rule laid down for the punctuation point; viz., a colon followed by a quotation mark calls for two spaces, but a comma followed by a quotation mark calls for but one space. (See rule No. 5)

7. A Dash must be written with two hyphens without spacing before or after. If a dash is necessary at the beginning of a line there should be no space between it and the following word.

8. Cut Characters. Any word written so close to top, bottom, or sides that a portion of any letter is cut off, must be penalized.

9. Words Wrongly Divided. A word wrongly divided at the end of a line must be penalized. A word hyphenated at the end of a line in the printed copy may or may not need the hyphen if occurring medially in the contestant's work.

10. Faulty Shifting. An error must be charged against every word where the shift key is incorrectly used. If parts only of the proper character appear, it is an error. If the complete character is discernible it is no error.

11. Lightly struck letters. If the outline of any character is discernible, there is no error.

12. Transposition. Letters transposed in any word constitute an error. Words transposed are penalized one error for the transposition; additional penalties are imposed for errors charged for rewriting.

13. Words Omitted. (See rule No. 24)

14. Crowding. No word shall occupy fewer than its proper number of spaces.

15. Words Inserted. (See rule No. 24)

16. Piling. If any portion of the body of one character overlaps any portion of the body of another character, or extends into the space between words to the extent that it would overlap any portion of the body of a character were there a character in that space, then it is an error.

17. Left-hand margin. Characters beginning lines, except in paragraphs, must all be struck at the same point of the scale. If printed to the left or right of that point, an error must be charged.

18. X-ing. Work in which work is X-ed will not be received.

19. Erasing. The use of an eraser is not allowed.

20. Errors in printed copy. Errors found in the printed copy may be corrected or written as per copy, but in no case shall an error be charged against such words unless they are omitted.

21. Last word. An error made in the last word written, whether completed or not, must be charged.

22. One error per word. But one error shall be penalized in any one word.

23. General Rule. Every word omitted, inserted, misspelled, or in any manner changed from the printed copy (save in the case of transposition and rewritten matter) must be penalized.